Freshwater Biology

Volumes 43–45, 2000

Edited by
A. G. Hildrew and C. R. Townsend
Applied Issues Editor: Richard K. Johnson

b
Blackwell
Science

© 2000 Blackwell Science Ltd

Published by Blackwell Science Ltd
Osney Mead, Oxford OX2 0EL
25 John Street, London WCIN 2BL
23 Ainslie Place, Edinburgh EH3 6AJ
350 Main Street, Malden, MA 02148-5018, USA
54 University Street, Carlton, Victoria 3053, Australia

Other Editorial Offices:
Blackwell Wissenschafts-Verlag GmbH, Kurfürstendam 57, D-10707, Berlin, Germany

Blackwell Science Ltd, 10 rue Casimir Delavigne, 75006 Paris, France

Blackwell Science KK, MG Kodenmacho Building, 7-10 Kodenmacho, Nihombashi, Chou-ku, Tokyo 104, Japan

Authorization to photocopy items for internal or personal use, or the internal or personal use of specific clients, is granted by Blackwell Science for libraries and other users registered with the Copyright Clearance Center (CCC) Transactional Reporting Service, provided that the base fee of $15.00 per copy is paid directly to CCC, 222 Rosewood Drive, Suite 910, Danvers, MA 01923, USA. This consent does not extend to other kinds of copying, such as copying for general distribution, for advertising or promotional purposes, for creating new collective works or for resale. Special requests should be addressed to the Editor, *Freshwater Biology* ISSN 0046-5070/00.

Freshwater Biology is covered by *Current Contents, ASFA, Science Citation Index, Chemical Abstracts and EmBASE/Excerpta Medica/Biobase/Current Awareness in Biological Sciences.*

ISSN 0046-5070

Typset by Datapage International, Dublin, Ireland and printed by Information Press, Oxford, U.K.

Contents

Volume 43, Issue 1, January 2000

Original Articles

1 *M. Real, M. Rieradevall and N. Prat: Chironomus* species (Diptera: Chironomidae) in the profundal benthos of Spanish reservoirs and lakes: factors affecting their distribution patterns

19 *Carolyn W. Burns:* Crowding-induced changes in growth, reproduction and morphology of *Daphnia*

31 *R. G. Pearson and N. M. Connolly:* Nutrient enhancement, food equality and community dynamics in a tropical rainforest stream

43 *Nigel J. Willby, Vicky J. Abernethy and Benoît O. L. Demars:* Attribute-based classification of European hydrophytes and its relationship to habitat utilization

75 *Göran Englund and James J. Krupa:* Habitat use by crayfish in stream pools: influence of predators, depth and body size

85 *Andrew Bially and Hugh MacIsaac:* Fouling mussels (*Dreissena* spp.) colonize soft sediments in Lake Erie and facilitate benthic invertebrates

99 *Heike Ruff and Gerhard Maier:* Calcium carbonate deposits reduce predation pressure to *Gammarus fossarum* from salamander larvae

107 *Thomas F. Nalepa, David J Hartson, Jennifer Buchanan, Joann F. Cavaletto, Gregory A. Lang and Stephen J. Lozano:* Spatial variation in density, mean size and physiological condition of the holarctic amphipod *Diporeia* spp. in Lake Michigan

121 *Anne Chenuil, Laurent Crespin, Laurent Pouyaud and Berrbi Patrick:* Movements of adult fish in a hybrid zone revealed by microsatellite genetic analysis and capture-recapture data

Applied Issues

133 *Brenda J. Hann and Michael A Turner:* Littoral microcrustacea in Lake 302S in the Experimental Lakes Area of Canada: acidification and recovery

147 **Book Review**

Volume 43, Issue 2, February 2000

Original Articles

149 *Frank Johansson:* The slow-fast life style characteristics in a suite of six species of odonate larvae

161 *Anssi Laurila:* Competitive ability and the coexistence of anuran larvae in freshwater rockpools

175 *Philippe Usseglio-Polatera, Michel Bournaud, Philippe Richoux and Henri Tachet:* Biological and ecological traits of benthic fresh-water macroinvertebrates: relationships and definition of groups with similar traits

207 *Peter M. Yurista:* Cyclomorphois in *Daphnia lumholtzi* induced by temperature

215 *Helen G. Butler, Matthew G. Edworthy and J. Cynan Ellis-Evans:* Temporal plankton dynamics in an oligotrophic maritime Antarctic lake

231 *Richard B. Hitchman and Harriet L. J. Jones:* The role of mixotrophic protists in the population dynamics of the microbial food web in a small artificial pond

243 *Lee C. Hastie, Mark R. Young and Phillip J. Boon:* Growth characteristics of freshwater pearl mussels, *Margaritifera margaritifera* (L.)

257 *Vera Istvánovics, Hesham M. Shafik, Mátyás Présing and Szilvester Juhos:* Growth and phosphate uptake kinetics of the cyanobacterium, *Cylindrospermopsis raciborskii* (Cyanophyceae) in throughflow cultures

Applied Issues

277 *Stéphane Charvet, Bernhard Statzner, Philippe Usseglio-Polatera and Bernard Dumont:* Traits of benthic macroinvertebrates in semi-natural French streams: an initial application to biomonitoring in Europe

© 2000 Blackwell Science Ltd

Volume 43, Issue 3, March 2000

Special issue: Ecological organisation of lake districts

Original Articles

297 *T. K. Kratz and Thomas M. Frost:* The ecological organisation of lake districts: general introduction

301 *Joan L. Riera, John. J. Magnuson, Timothy K. Kratz and Katherine E. Webster:* A geomorphic template for the analysis of lake districts applied to the Northern Highland Lake District, Wisconsin, USA

319 *Aruna S. Dixit, Roland I. Hall, Peter R. Leavitt, Roberto Quinlan and John P. Smol:* Effects of sequential depositional basins on lake response to urban and agricultural pollution: a palaeoecological analysis of the Qu'Appelle Valley, Saskatchewan, Canada

339 *Paul A. Bukaveckas and Marise Robbins-Forbes:* Role of dissolved organic carbon in the attenuation of photosynthetically active and ultraviolet radiation in Adirondack lakes

355 *W. Berry Lyons, Andrew Fountain, Peter Doran, John C. Priscu, Klaus Neumann and Kathleen A. Welch:* The importance of landscape position and legacy: the evolution of the lakes in Taylor Valley, Antarctica

369 *Jirí Kopácek, Evzen Stuchlík, Vera Straskrabová and Petra Psenáková:* Factors governing nutrient status of mountain lakes in the Tatra Mountains

385 *T.P. Gronskaya:* Lake districts of northwestern Russia: identification of subregions based on analyses of hydrologic data

391 *Patricia A. Saunders, William H. Shaw and Paul A. Bukaveckas:* Differences in nutrient limitation and grazer suppression of phytoplankton in seepage and drainage lakes of the Adirondack region, NY, U.S.A.

409 *David Bruce Lewis and John J. Magnuson:* Landscape spatial patterns in freshwater snail assemblages across Northern Highland catchments

421 *Cynthia A. Paszkowski and William M. Tonn:* Community concordance between the fish and aquatic birds of northern Alberta lakes: the relative importance of environmental and biotic factors

439 *Tara Reed Andersen, Elena M. Bennett, Bradley S. Jorgensen, George Lauster, David Bruce Lewis, David Nowacek, Joan L. Riera, Beth L. Sanderson and Richard Steadman:* The distribution of recreational boating across lakes: do landscape variables affect recreational use?

449 *D. G. George, J. F. Talling and E. Rigg:* Factors influencing the temporal coherence of five lakes in the English Lake District

463 *Jill S. Baron and Nel Caine:* The temporal coherence of two alpine lake basins of the Colorado Front Range, U.S.A.

477 *George W. Kling, George W. Kipphut, Michael M. Miller and W. John O'Brien:* Integration of lakes and streams in a landscape perspective: the importance of material processing on spatial and temporal coherence

499 *Katherine E. Webster, Patricia A. Soranno, Stephen B. Baines, Timothy K. Kratz, Carl J. Bowser, Peter J. Dillon, Paul Campbell, Everett J. Fee and Robert E. Hecky:* Structuring features of lake districts: landscape controls on lake chemical responses to drought

517 *Barbara J. Benson, John D. Lenters, John J. Magnuson, Maryan Stubbs, Timothy K. Kratz, Peter J. Dillon, Robert E. Hecky and Richard C. Lathrop:* Regional coherence of climatic and lake thermal variables of four lake districts in the Upper Great Lakes Region of North America

Volume 43, Issue 4, April 2000

Original Articles

529 *H. B. O. Lung'ayia, A. M'Harzi, M. Tackx, J. Gichuki and J.J. Symoens:* Phytoplankton community structure and environment in the Kenyan waters of Lake Victoria

545 *Mark E. Ledger and Alan G. Hildrew:* Herbivory in an acid stream

557 *D. G. George and I. J. Winfield:* Factors influencing the spatial distribution of zooplankton and fish in Loch Ness, UK

571 *D. G. George:* Remote sensing evidence for the episodic transport of phosphorus from the littoral zone of a thermally stratified lake

579 *S. Taylor Jarnagin, Brandon K. Swan and W. Charles Kerfoot:* Fish as vectors in the dispersal of *Bythotrephes cederstroemi*: diapausing eggs survive passage through the gut

© 2000 Blackwell Science Ltd

591 *J. Iwan Jones, Brian Moss, John W. Eaton and Johnstone O. Young:* Do submerged aquatic plants influence periphyton community composition for the benefit of invertebrate mutualists?

605 *L. G Leff:* Longitudinal changes in microbial assemblages of the Ogeechee River

617 *John F. Murphy and Paul S. Giller:* Seasonal dynamics of macroinvertebrate assemblages in the benthos and associated with detritus packs in two low-order streams with different riparian vegetation

633 *P. Wiberg-Larsen, K. P. Brodersen, S. Birkholm, P. N. Gron and J. Skriver:* Species richness and assemblage structure of Trichoptera in Danish streams

Applied Issues

649 *Amy E. McNamara and Walter R. Hill:* UV-B irradiance gradient affects photosynthesis and pigments but not food quality of periphyton

663 **Book Review**

Volume 44, Issue 1, May 2000

Special issue: The role of meiofauna in lotic ecosystems

Original Articles

1 *A. L. Robertson, S. D. Rundle and J. M. Schmid-Araya:* An introduction to a special issue on lotic meiofauna

5 *J. Kolasa:* The biology and ecology of lotic microturbellarians

15 *C. Ricci and M. Balsamo:* The biology and ecology of lotic rotifera and gastrotricha

29 *W. Traunspurger:* The biology and ecology of lotic nematodes

47 *A. Di Sabatino, R. Gerecke and P. Martin:* The biology and ecology of lotic water mites (Hydrachnidia)

63 *M.-J. Dole-Olivier, D. M. P. Galassi, P. Marmonier and M. Creuzé des Châtelliers:* The biology and ecology of lotic microcrustaceans

93 *D. R. Nelson and N. J. Marley:* The biology and ecology of lotic Tardigrada

109 *C. M. Swan and M. A. Palmer:* What drives small-scale spatial patterns in lotic meiofauna communities?

123 *S. D. Rundle, D. T. Bilton and D. K. Shiozawa:* Global and regional patterns in lotic meiofauna

135 *A. L. Robertson:* Lotic meiofaunal community dynamics: colonisation, resilience and persistence in a spatially and temporally heterogenous environment

149 *J. M. Schmid-Araya and P. E. Schmid:* Trophic relationships: integrating meiofauna into a realistic benthic food web

165 *C. C. Hakenkamp and A. Morin:* The importance of meiofauna to lotic ecosystem functioning

177 *A. L. Robertson, S. D. Rundle and J. M. Schmid-Araya:* Putting the meio- into stream ecology: current findings and future directions for lotic meiofaunal research

Volume 44, Issue 2, June 2000

Original Articles

185 *Irmgard Blindow, Anders Hargeby, Bálint M. A. Wagner and Gunner Andersson:* How important is the crustacean plankton for the maintenance of water clarity in shallow lakes with abundant submerged vegetation?

199 *Rainer Poepperl:* Benthic secondary production and biomass of insects emerging from a northern German temperate stream

213 *B. H. Hill, R. K. Hall, P. Husby, A. T. Herlihy and M. Dunne:* Interregional comparisons of sediment microbial respiration in streams

223 *Elena Lichman:* Growth rates of phytoplankton under fluctuating light

237 *J. M. Elliott and M. A. Hurley:* Daily energy intake and growth of piscivorous brown trout, *Salmo trutta*

247 *V. A. Reid, G. R. Carvalho and D. G. George:* Molecular genetic analysis of *Daphnia* in the English Lake District: species identify, hybridisation and resting egg banks

255 *F. Mermillod-Blondin, M. Creuze Des Chatelliers, P. Marmonier and M.-J. Dole-Oliver:* Distribution of solutes, microbes and invertebrates in river sediments along a riffle-pool-riffle sequence

271 *Paul L. Stutzman:* An examination of the potential effects of food limitation on the ultra-violet radiation (UVR) tolerance of *Diaptomus minutus*

© 2000 Blackwell Science Ltd

Applied Issues

279 *Harry V. Leland and Stephen D. Porter:* Distribution of benthic algae in the upper Illinois River basin in relation to geology and land use

303 *Julie E. Parker and Stephen C. Maberly:* Biological response to lake remediation by phosphate stripping: control of *Cladophora*

311 *M. R. James, I. Hawes and M. Weatherhead:* Removal of settled sediments and periphyton from macrophytes by grazing invertebrates in the littoral zone of a large oligotrophic lake

327 *Jean Pierre H. B. Ometo, Luiz A. Martinelli, Maria Victoria Ballester, Alaídes Gessner, Alex V. Krusche, Reynaldo L. Victoria and Michael Williams:* Effects of land use on water chemistry and macroinvertebrates in two streams of the Piracicaba River Basin, south-east Brazil

339 *Yangdong Pan, R. Jan Stevenson, Panchabi Vaithiyanathan, Jennifer Slate and Curtis J. Richardson:* Changes in algal assemblages along observed and experimental phosphorus gradients in a subtropical wetland, U.S.A.

355 *Craig P. Doberstein, James R. Karr and Loveday L. Conquest:* The effect of fixed-count sub-sampling on macroinvertebrate biomonitoring in small streams

Volume 44, Issue 3, July 2000

Original Articles

375 *Vladimir Matveev, Lilian Matveeva and Gary J. Jones:* Relative impacts of *Daphnia* grazing and direct stimulation by fish on phytoplankton abundance in mesocosm communities

387 *Thomas M. McCarthy and Wendy A. Fisher:* Multiple predator-avoidance behaviours of the freshwater snail *Physella heterostropha pomila*: responses vary with risk

399 *Yannick R. Delettre and Nathalie Morvan:* Dispersal of adult aquatic Chirnomidae (Diptera) in agricultural landscapes

413 *Ross M. Thompson and Colin R. Townsend:* Is resolution the solution? The effect of taxonomic resolution on the calculated properties of three stream food webs

423 *José M. Conde-Porcuna:* Relative importance of competition with *Daphnia* (Cladocera) and nutrient limitation on *Anuraeopsis* (Rotifera) population dynamics in a laboratory study

431 *Tammi L. Richardson, Christopher E. Gibson and S. Ivan Heaney:* Temperature, growth and seasonal succession of phytoplankton in Lake Baikal, Siberia

441 *Sebastien Brosse and Sovan Lek:* Modelling roach (*Rutilus rutilus*) microhabitat using linear and non-linear techniques

453 *Silke Hochsträdter:* Seasonal changes in C:P ratios of seston, bacteria, phytoplankton and zooplankton in a deep, mesotrophic lake

465 *E. A. Flory and A. M. Milner:* Macroinvertebrate community succession in Wolf Point Creek, Glacier Bay National Park, Alaska

481 *Peter J. Jacobson, Kathryn M. Jacobson, Paul L. Angermeier and Don S. Cherry:* Variation in material transport and water chemistry along a large ephemeral river in the Namib Desert

493 *Urs Uehlinger, Christof König and Peter Reichert:* Variability of photosynthesis-irradiance curves and ecosystem respiration in a small river

509 *Christopher A. Robinson, Timothy J. Thom and Martyn C. Lucas:* Ranging behaviour of a large freshwater invertebrate, the white-clawed crayfish *Austropotamobius pallipes*

523 *G. Winfield Fairchild, Ann M. Faulds and James F. Matta:* Beetle assemblages in ponds: effects of habitat and site age

535 *Marilyn J. Myers, Chris P. Meyer and Vincent H. Resh:* Neritid and thiarid gastropods from French Polynesian streams: how reproductive (sexual, parthenogenetic) and dispersal (active, passive) affect population structure

547 *M. Battini, V. Rocco, M. Lozada and B. Tartarotti and H. E. Zagarese,:* Effects of ultraviolet radiation on the eggs of landlocked *Galaxias maculatus* (Galaxiidae, pisces) in northwestern Patagonia

Opinion

553 *Gernot Falkner and Renate Falkner:* Objectivistic views in biology: an obstacle to our understanding of self-organization processes in aquatic ecosystems

© 2000 Blackwell Science Ltd

Volume 44, Issue 4, August 2000

Original Articles

569 *Jeffrey D. Jack and James H. Thorp:* Effects of the benthic suspension feeder *Dreissena polymorpha* on zooplankton in a large river

581 *P. A. Brewin, S. T. Buckton and S. J. Ormerod:* The seasonal dynamics and persistence of stream macroinvertebrates in Nepal: do monsoon floods represent disturbance?

595 *James F. Gillooly and Stanley I. Dodson:* The relationship of egg size and incubation temperature to embryonic development time in univoltine and multivoltine aquatic insects

605 *J. M. Elliott and M. A. Hurley:* Optimum energy intake and gross efficiency of energy conversion for brown trout, *Salmo trutta*, feeding on invertebrates or fish

617 *L. E. Miranda, M. P. Driscoll and M. S. Allen:* Transient physiochemical microhabitats facilitate fish survival in inhospitable aquatic plant stands

629 *Nathalie Bourassa and Antonella Cattaneo:* Responses of a lake outlet community to light and nutrient manipulation: effects on periphyton and invertebrate biomass and composition

641 *John A. Downing, Hendrik Van Leeuwen and L. Antonio Di Paolo:* Substratum patch selection in the lacustrine mussels *Elliptio complanata* and *Pyganodon grandis grandis*

649 *Emily C. Roberts, Johanna Laybourn-Parry, Diane M. McKnight and Gianfranco Novarino:* Stratification and dynamics of microbial loop communities in Lake Fryxell, Antartica

663 **Book review**

Volume 45, Issue 1, September 2000

Original Articles

1 *Aloysio S. Ferrão-Filho, Sandra M. F. O. Azevedo and William R. DeMott:* Effects of toxic and nontoxic cyanobacteria on the life history of tropical and temperate cladocerans

21 *Karl E. Havens, Therese L. East, Joseph Marcus, Patrick Essex, Benjamin Bolan, Stephanie Raymond and John R. Beaver:* Dynamics of the exotic *Daphnia lumholtzii* and native macro-zooplankton in a subtropical chain-of-lakes in Florida, U.S.A.

33 *Arto Huhta, Timo Muotka and Pertti Tikkanen:* Nocturnal drift of mayfly nymphs as a post-contact antipredator mechanism

43 *Serge Thomas, Philippe Cecchi, Daniel Corbin and Jacques Lemoalle:* The different primary producers in a small African tropical reservoir during a drought: temporal changes and interactions

57 *Laura L. Rempel, John S. Richardson and Michael C. Healey:* Macroinvertebrate community structure along gradients of hydraulic and sedimentary conditions in a large gravel-bed river

75 *J. S. Gregory, S. S. Beesley and R. W. Van Kirk:* Effect of springtime water temperature on the time of emergence and size of *Pteronarcys californica* in the Henry's Fork catchment, Idaho, U.S.A.

Applied Issues

85 *Barbara R. Kaenel, Heinrich Buehrer and Urs Uehlinger:* Effects of aquatic plant management on stream metabolism and oxygen balance in streams

97 **Book Reviews**

Volume 45, Issue 2, October 2000

Special issue: Plankton population dynamics: food web interactions and abiotic constraints

Original Articles

105 *Karl O. Rothhaupt:* Plankton population dynamics: food web interactions and abiotic constraints

111 *D. G. George:* The impact of regional-scale changes in the weather on the long-term dynamics of *Eudiaptomus* and *Daphnia* in Esthwaite Water, Cumbria

123 *István Scheuring, György Károlyi, Áron Péntek, Tamás Tél and Zoltán Toroczkai:* A model for resolving the plankton paradox: coexistence in open flows

133 *Nelson G. Hairston, Jr, Anne-Mette Hansen and William R. Schaffner:* The effect of diapause emergence on the seasonal dynamics of a zooplankton assemblage

© 2000 Blackwell Science Ltd

147 *Tobias Garstecki, Richard Verhoeven, Stephen A. Wickham and Hartmut Arndt:* Benthic–pelagic coupling: a comparison of the community structure of benthic and planktonic heterotrophic protists in shallow inlets of the southern Baltic

169 *Dag O. Hessen and Nina Alstad Rukke:* The costs of moulting in *Daphnia*; mineral regulation of carbon budgets

179 *Maarten Boersma and Claus-Peter Stelzer:* Response of a zooplankton community to the addition of unsaturated fatty acids: an enclosure study

189 *Eric Von Elert and Paul Stampfl:* Food quality for *Eudiaptomus gracilis*: the importance of particular highly unsaturated fatty acids

201 *Erik Jeppesen, Jens Peder Jensen, Martin Søndergaard, Torben Lauridsen and Frank Landkildehus:* Trophic structure, species richness and biodiversity in Danish lakes: changes along a phosphorous gradient

219 *Roger I. Jones:* Mixotrophy in planktonic protists: an overview

227 *John R. Dolan and Maria Teresa Pérez:* Costs, benefits and characteristics of mixotrophy in marine oligotrichs

239 *Horst Malchow:* Non-equilibrium spatio-temporal patterns in models of non-linear plankton dynamics

253 *Thomas Mehner:* Influence of spring warming on the predation rate of underyearling fish on *Daphnia* – a deterministic simulation approach

265 *Marten Scheffer and Sergio Rinaldi:* Minimal models of top-down control of phytoplankton

Volume 45, Issue 3, November 2000

Original Articles

285 *C. E. Gibson, G. Wang and R. H. Foy:* Silica and diatom growth in Lough Neagh: the importance of internal recycling

295 *Ferenc A. de Szalay and V. H. Resh:* Factors influencing macroinvertebrate colonization of seasonal wetlands: responses to emergent plant cover

309 *Alastair M. Suren, Graeme M. Smart, Rob A. Smith and Stephanie L. R. Brown:* Drag coefficients of stream bryophytes: experimental determinations and ecological significance

319 *Urs Uehlinger:* Resistance and resilience of ecosystem metabolism in a flood-prone river system

333 *M. O'Connell, D. S. Baldwin, A. I. Robertson and G. Rees:* Release and bioavailability of dissolved organic matter from floodplain litter: influence of origin and oxygen levels

Applied Issues

343 *Nerida M. Davies, Richard H. Norris and Martin C. Thoms:* Prediction and assessment of local stream habitat features using large-scale catchment characteristics

371 **Book Review**

373 **Corrigendum**

Volume 45, Issue 4, December 2000

Original Articles

373 *Ben K. Basu, J. Kalff and B. Pinel-Alloul:* The influence of macrophyte beds on plankton communities and their export from fluvial lakes in the St Lawrence River

383 *Peter J. Shaw, Roger I. Jones and Henk de Haan:* The influence of humic substances on the molecular weigh distributions of phosphate and iron in epilimnetic lake waters

394 *Helen Bennion, Donald Monteith and Peter Appleby:* Temporal and geographical variation in lake trophic status in the English Lake District: evidence from (sub)fossil diatoms and aquatic macrophytes

413 *Maria-José Caramujo and Maria-José Boavida:* Induction and costs of tail spine elongation in *Daphnia hyalina* x *galeata*: reduction of susceptibility to copepod predation

Applied Issues

425 *Lydia King, Philip Barker and Roger I. Jones:* Epilithic algal communities and their relationship to environmental variables in lakes of the English Lake District

443 *David W. Garton and Ladd E. Johnson:* Variation in growth rates of the zebra mussel, *Dreissena polymorpha*, within Lake Wawasee

© 2000 Blackwell Science Ltd